

ETHX-2214-DS3 and ETHX-2224-DS3
EtherXtend DS3 Ethernet Access Device
Installation Instructions



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Introduction to ETHX-2214-DS3 and ETHX-2224-DS3

The EtherXtend 2200 Series of DS3 Ethernet Access Devices (EADs) allows Carriers, ISPs and PTTs to deliver Ethernet services to virtually anywhere, using standard unframed DS3 circuits. These units permit the efficient and reliable delivery of Ethernet on a single DS3 or on a bonded pair of DS3 circuits. With the ability to provide up to 90 Mbps of symmetric data transport, near native 10/100BT Ethernet speeds can be achieved to deliver demanding LAN, WAN, and IP-based services to an increasingly sophisticated generation of small and medium-sized business customers.

The EtherXtend 2200 Series of DS3 EADs are available in two base models:

- **ETHX-2214-DS3** – Provides one (1) DS3 port
- **ETHX-2224-DS3** – Provides two (2) DS3 ports

Both models feature an integrated 4-port 10/100 Ethernet switch. On a dual-port device (ETHX-2224-DS3), the two DS3 ports can be bonded together to provide 90 Mbps data rates, achieving near native 100Mbps Ethernet speeds.

The loop bonding technology used by the EtherXtend 2200 Series DS3 EADs is the industry-leading, pre-standards based Net-to-Net (N2N) loop bonding protocol, which offers automatic, efficient, resilient, and configuration-free deployment with greater total throughput capacity than a traditional DS3 circuit. Zhone's loop bonded technology provides automatic load balancing and fail-over for optimum redundancy and data throughput.

To maximize the total bandwidth available for ethernet traffic, the ETHX-22x4-DS3 devices operate in a DS3 framer-bypass mode (i.e. the ethernet traffic is mapped onto the entire 44.736 Mbps of each DS3 facility, including any overhead bits normally associated with M13 or C-bit Parity DS3 framing formats).

NOTE: Only unframed DS3 circuits are supported



The ETHX-22x4-DS3 devices must be connected to unchannelized and unframed DS3 facilities.

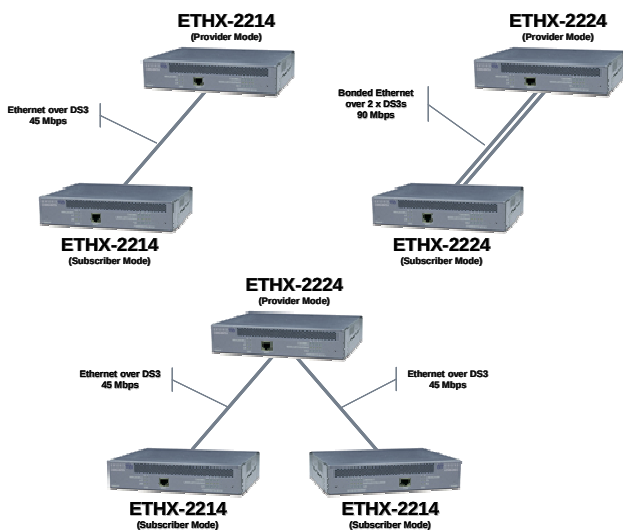
Asynchronous M13 and/or C-Bit DS3 framing formats are not supported on the ETHX-22x4-DS3 devices. Attempts to connect these devices to anything other than unframed and unchannelized DS3 facilities will lead to excessive bit errors and unreliable operation.

The ETHX-22x4-DS3 units utilize the entire 44.736 Mbps DS3 bandwidth for data transmission. Therefore, if you are leasing DS3 facilities for use with the ETHX-22x4-DS3 devices, you must verify with your DS3 service provider that they will provide access to fully unframed DS3 facilities. Furthermore, they must also guarantee that any intermediary DS3 multiplexing equipment they use for end-to-end connectivity will regenerate the entire 44.736 Mbps of bandwidth without modifying or omitting any of the bits typically associated with overhead in framed DS3 facilities.

Provider vs Subscriber Units

The EtherXtend 2200 DS3 units can be operated in either a *Provider* or *Subscriber* mode. A *Subscriber* unit is always considered as a 'slave' to the *Provider* unit, which acts as a 'master' when enabling the DS3 ports and loop bonding configurations. Therefore when using the ETHX-22x4-DS3 devices in a network, one *Provider* and one *Subscriber* unit are required on the unframed DS3.

Typical applications of EtherXtend 2200 DS3 EADs are shown in the figure below. Note that devices can be connected together, in a point-to-point (or book-ended) configuration, using either a single 45 Mbps unframed DS3 facility or two unframed DS3s (for a total bonded capacity of 90 Mbps). Alternatively, a star configuration is supported wherein a single ETHX-2224 can be connected to two separate ETHX-2214 units, each connected via a single unframed DS3 facility. The only constraint is that each connection pairs a unit operating as a *Provider* Unit with a unit operating as a *Subscriber* unit.



All EtherXtend 2200 DS3 units are shipped from the factory preconfigured to operate in the *Provider* mode. The operating mode of a unit can be changed via web management. See the "Web Interface" section of this document for the procedure to accomplish this.



NOTE: ETHX-22x4-DS3 units are not compatible with DNE4500 devices

ETHX-22x4-DS3 devices must be connected in one of the configurations depicted above. These units are not compatible with the former Net-to-Net / Paradyne DNE4500 DS3 network extenders.

Provider and Subscriber Unit Defaults

The following table highlights the differences between *Provider* and *Subscriber* units.

Table 1. Unit Defaults by Type

Feature	Provider Unit	Subscriber Unit
Default IP Address	192.168.254.252	192.168.254.251
Out-of-Band Management	Over Ethernet Ports	Over DS3 Ports
In-band Management	Over DS3 Ports	Over Ethernet Ports
Response to Broadcast ARP Request by IP Address	Unit answers	Unit does not answer on DS3 ports; answers only to ARP request on Ethernet ports.

Package Contents

Unpack and inspect the network extender. If there is any visible damage, do not attempt to install or connect the device. Instead, please contact your local sales representative, service representative, or distributor. Please refer to the *Service and Repair* section of this manual for additional support and contact information.

Release Notes

Before installing your network extender, you should update to the latest firmware load and review the associated release notes for your model. These are available for download on the *Service & Support* page under the *Downloads* heading at the Zhone website.

<http://www.zhone.com/support/downloads/firmware/ETHX-22xx/>

Product Documentation Online

Complete documentation for Zhone products is available at <http://www.zhone.com/>. Select *Service & Support*, and then select *Documentation*.

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Powering Up the Network Extender

The DC power terminal block on the network extender has five terminals: two positive, two negative, and one with no connection (NC). Only one positive terminal and one negative terminal pair need to be connected for operational purposes. The second positive and negative terminal pair may be connected to a backup DC power supply for redundancy purposes. There is also a system ground terminal on the back panel above the power connector. Connect this terminal to a reliable source of ground. The ground terminal must always be connected regardless of the powering connections. **DO NOT OPERATE THE NETWORK EXTENDER WITHOUT A GROUND CONNECTION.**

➤ Procedure

Power Connection - Grounding

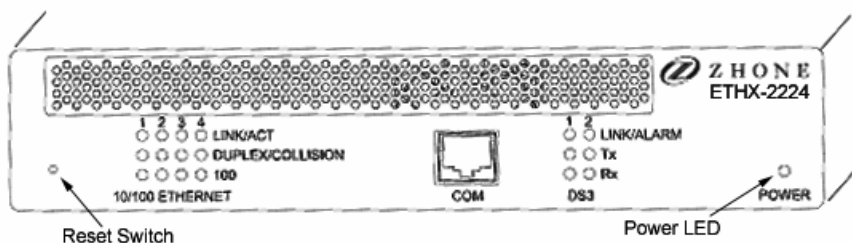
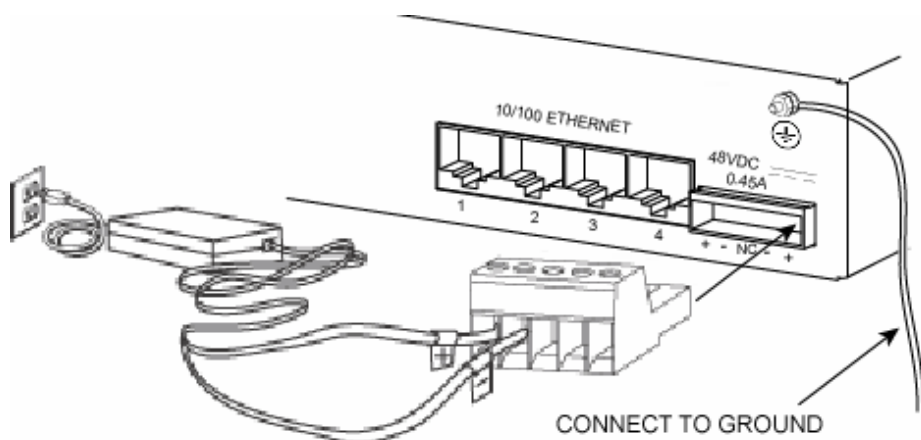
1. Connect a copper wire of at least 18 AWG from a ground source to the ground lug on the back of the unit. In Telco central office installations, the ground source must be a Common Bonding Network (CB-N).
2. The ampacity of the ground conductor shall be equal to, or greater than, the ampacity of the conductor connected to the DC power connection's DC return.
3. Strip the end of the ground wire. The bare stripped ends of the ground conductor must be coated with an anti oxidation compound before crimp connections are made to connector terminals. Crimp a connector (of a size suitable to fit the ground lug on the chassis) onto the prepared wire end. Use only listed connection terminals on the ground wire.
4. The ground lug on the unit has two nuts with a star washer between them. Remove the outer nut and star washer, put the ground connector (prepared in step 3 above) over the ground stud on the chassis. Replace the star washer on the stud, then the nut. Tighten the nut so that the ground connection is secure and will not rotate.

Power Connection – DC Power

1. Loosen all screws at the top of the power terminal strip.
2. Insert your -48 VDC lead into the negative (-) terminal of one of the terminal pairs. Tighten the screw for that terminal.
3. Insert your 48 VDC return lead into the positive (+) terminal of the same terminal pair as in Step 2. Tighten the screw for that terminal.
4. Repeat Step 2 and Step 3 for the free pair of power terminals if you have a redundant power supply.
5. Plug the power terminal strip into the power connector on the back of the unit.
6. Verify that the Power LED on the front of the network extender is illuminated.

Power Connection – AC Power

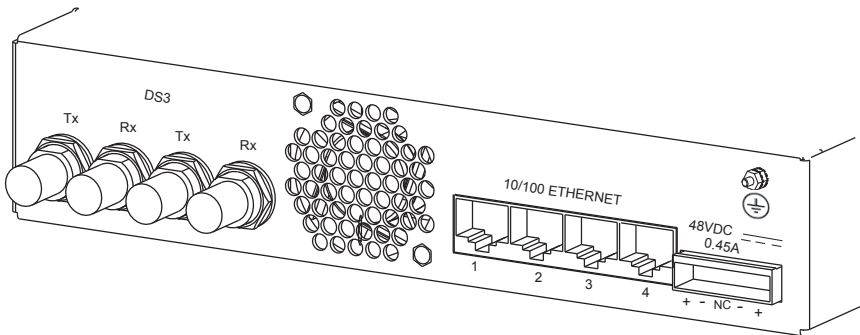
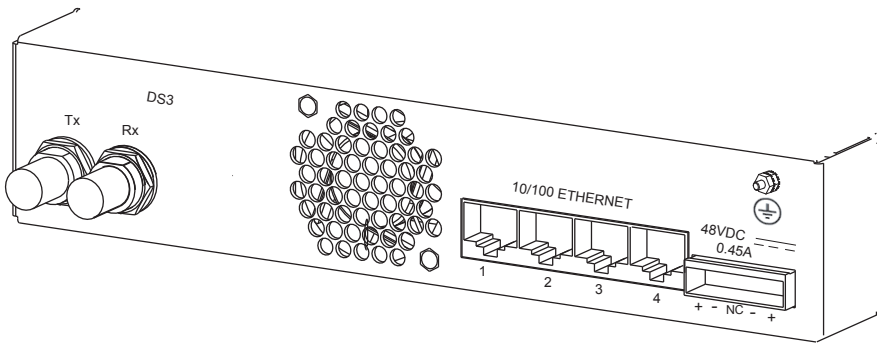
1. The AC power supply is shipped with the power terminal strip already attached. No AC power supply other than the one supplied with the ETHX-22x4-DS3 is approved for use in powering the unit. Using any other AC power supply could cause the unit to be non-compliant to emissions and safety regulations.
2. Plug the power terminal strip into the power connector on the back of the unit.
3. Plug the AC power cord into the AC power supply and into a compatible AC outlet.
4. Verify that the Power LED on the front of the network extender is illuminated.



Connecting the DS3 Lines

The ETHX-2214-DS3 device supports a single, unframed DS3 facility while the ETHX-2224-DS3 device supports up two (2) unframed DS3 facilities. The ETHX-2224-DS3 device can be operated with just one of the two DS3s connected, or can be used in loop bonded applications where both DS3 circuits are utilized.

Each DS3 port requires the use of two (2) 75 ohm BNC connectors, one each for transmit and receive signals.



Single DS3 Connection

A single line connection can be established between a single port *Subscriber* unit and either a single port or dual port ETHX-2224-DS3 *Provider* unit. Likewise, a single line connection can be established between a single port *Provider* unit and either a single port or dual port ETHX-2214-DS3 *Subscriber* unit.

➤ Procedure

1. Plug two coax cables, one for transmit (Tx) and one for receive (Rx), into the DS3 BNC 75 ohm port on the back of the network extender.
2. After connecting the other ends of the DS3 cables to suitable transport or multiplexing equipment, verify that there is a DS3 connection to the ETHX-22x4 unit by confirming that the DS3 LINK/ALARM LED on the front of the network extender flashes green to indicate the connection is established and operational. Refer to Table 2 on page 12 for a description of the DS3 LED indicators

Dual DS3 Loop Bonded Connections

Using two DS3 lines for one network connection (loop bonding) effectively doubles the speed and data throughput capability of the network extender. Two DS3 lines also act as a backup should one of the lines become disabled.

➤ Procedure

1. Plug the DS3 cables into the DS3 BNC 75 ohm connectors on the back of the network extender. Each DS3 connection requires two coax cables; one for transmit (Tx) and one for receive (Rx). Either port can be connected first.
2. After connecting the other ends of the DS3 cables to suitable transport or multiplexing equipment, verify that there are DS3 connections to the ETHX-22x4 unit by confirming that the DS3 LINK/ALARM LEDs on the front of the network extender flashes green to indicate that the connections are established and operational. Refer to Table 2 on page 12 for a description of the DS3 LED indicators

Connecting the Ethernet Lines

The 10/100BaseT Ethernet ports can auto-negotiate speed and duplex mode in accordance with the remote equipment to which it is connected. Alternatively, Ethernet speed and duplex mode configurations can be configured using web management. (See *Web Interface* on page 14.) For the best connection results, the remote devices (PCs, hubs, or switches) should be set to auto-negotiate speed and duplex mode.

➤ Procedure

1. Plug an Ethernet cable into one of the 10/100 ETHERNET ports on the back of the network extender. A straight-through cable can be used for all applications.
2. Verify the Ethernet connection: After connecting the other end of the Ethernet cable to a suitable device, a solid green illumination of the corresponding 10/100 ETHERNET Connection LINK/ACT (Link/Activity) LED on the front of the network extender indicates a connection has been established. If the Ethernet LINK/ACT LED is illuminated but the Ethernet 100 LED is not lit, then a 10 Mbps connection has been established. If the Ethernet LINK/ACT and 100 LEDs are both illuminated, then a 100 Mbps connection has been established.

LED Indicators

Table 2. DS3 LEDs

LED	State	Indication	Additional Information
DS3 Connections LINK/ACT (Ports 1 or 1&2)	Flashing Green*	DS3 connection is established and active	Traffic is flowing.
	Solid Green	DS3 link	A connection exists but there is indication of a problem with the DS3 line.
	Solid Amber	Remote Alarm Indication (RAI). The outgoing connection from the unit has been lost; no data is being transmitted.	Yellow alarm. The unit's partner network extender has lost its incoming connection and has LOS.
	Pulsing Amber	Alarm Indication Signal (AIS). An indirect connection has been lost; the unit may no longer be receiving data from its partner network extender.	Blue alarm. The unit's partner network extender has lost a connection with an intermediate device and has LOS or RAI.
DS3 Connections Tx (Ports 1 or 1&2)	Flashing Amber	Data is being transmitted	.
	Not Illuminated	No data is being transmitted.	
DS3 Connections Rx (Ports 1 or 1&2))	Flashing Amber	Data is being received.	
	Not Illuminated	No data is being received.	
Power	Solid Green	The unit is powered	If the Power LED is not illuminated, it is unlikely that the network extender is receiving power and therefore none of the LEDs will be illuminated

* A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

Table 3. Ethernet LEDs

LED	State	Indication	Additional Information
10/100 Ethernet Connections LINK/ACT	Pulsing Green	Standard operation	Traffic is flowing without any problems.
	Solid Green	Ethernet connection is established	If the Ethernet LINK/ACT LED is illuminated but not the Ethernet 100 LED then a 10 Mbps connection has been established. If the Ethernet 100 LED is also illuminated, then a 100 Mbps connection has been established.
	Not Illuminated	No Ethernet connection	The Ethernet 100 and Act LEDs will remain unlit by default.
10/100 Ethernet Connections Duplex/ Collision	Solid Amber	Full duplex Ethernet connection.	
	Not Illuminated	No link or functioning at half duplex.	
	Pulsing Amber	Half duplex link with packet collisions.	
10/100 Ethernet Connections 100	Solid Green	100 Mbps Ethernet connection is established	If the Ethernet 100 LED is illuminated, the Ethernet Lnk/Act LED will be green.
	Not Illuminated	No 100 Mbps Ethernet connection	If the Ethernet 100 LED remains unlit but the Ethernet LINK/ACT LED is green, then a connection has been established at 10 Mbps rather than 100 Mbps.

Web Interface

The network extender's integral web management lets you configure and monitor the network extender using a standard web browser.

Web Interface System Requirements

- **Web Browser** – Required for running web management. Compatible web browsers include, but are not limited to, Microsoft Internet Explorer (v4.0 or higher) and Netscape Navigator (v4.0 or higher). Web management is optimized for use with Internet Explorer.

Use your browser's default settings when running web management. JavaScript must be enabled.

- **Screen Resolution** – 1024 x 768 pixels is the minimum resolution required for all web management views to fit within the dimensions of most monitors and laptops. Lower screen resolutions (such as 800 x 600 pixels) may cause web management screens to exceed the width or height of the screen. To verify screen resolution on a Windows system:

- Right click on your *Desktop*
- Select *Properties*
- Click the *Settings* tab
- Adjust the *Screen Resolution* as needed

Configuring a Windows PC to Communicate with Web Management

To communicate with web management, the Ethernet interface on your PC must be on the same subnet as the network extender. For example, to configure the IP address under Windows XP:

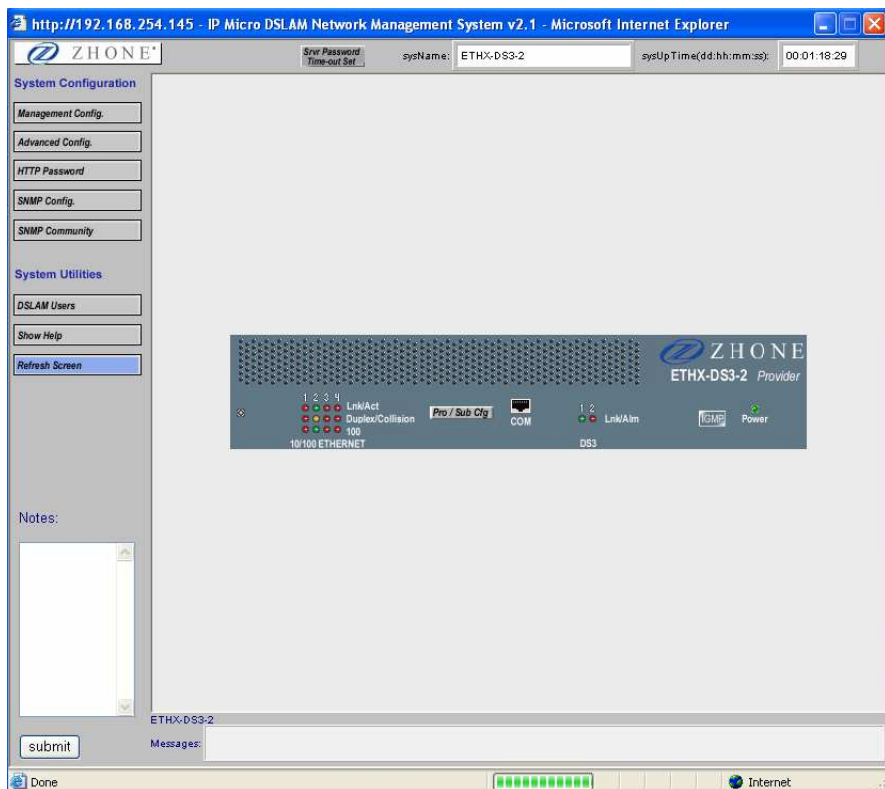
➤ Procedure

1. In the Windows task bar, click on the *Start* button, then click on *Control Panel*.
2. Double-click on the *Network Connections* icon.
3. In the *LAN* or *High-Speed Internet* window, right-click on the icon corresponding to your network interface card (NIC) and select *Properties* (this icon is often labeled as *Local Area Connection*). The *Local Area Connection* dialog box will be displayed with a list of currently installed network items.
4. Ensure that the check box to the left of the item labeled *Internet Protocol (TCP/IP)* is checked, then click on *Properties*.

5. Write down the current *IP Address* and *Subnet Mask* in the *Internet Protocol (TCP/IP) Properties* dialog box. When you are done using web management, you will need to reconfigure your PC with these values.
6. In the *Internet Protocol (TCP/IP) Properties* dialog box, click in the radio button labeled *Use the following IP address* and type 192.168.254.x (where x is any number between 3 and 250, inclusive) in the IP Address field.
7. Type 255.255.255.0 in the *Subnet Mask* field.
8. Click on *OK* twice to confirm your changes, and close the *Control Panel*.
9. Start your web browser. Type 192.168.254.252 (for a *Provider* unit) or 192.168.254.251 (for a *Subscriber* unit) into the *Address* field and press *Enter*. The web server opening screen appears.
10. Click on >> *Next* >>. The login dialog box appears. Login using:

Username:	superuser	Note – Username and Password are case sensitive. Enter them exactly as shown
Password:	Password	

The web management home page appears.



From this screen you can:

Click on . . .	To configure . . .
Management Config.	IP Address, Subnet Mask, Default Gateway, In-band Management VLAN ID and Priority
Advanced Config.	System Name and Location, Management IP Address Filter, TFTP and Telnet access
HTTP Password	General and Superuser Passwords
SNMP Config.	SNMP Notification IP Addresses and SNMP Traps
SNMP Community	SNMP Community Names
Pro/Sub Cfg	<i>Provider</i> or <i>Subscriber</i> mode
IGMP	IGMP configuration, MAC (Display only) Search (IGMP or MAC)
Srvr Password Time-out Set	Change web management Password Time-out
DSLAM Users	Display only
Show Help	Provides a link to online help via the Internet
Refresh Screen	Refreshes web management screen
Ethernet Connections Lnk/Act LEDs	Ethernet Duplex Mode, Speed, and Native VLAN ID
DS3 Connections Lnk/Alm LEDs	DS3 Circuit Configuration DS3 (Tx Buildout, and Clock Source, etc), Filter Configuration, DSCP Rules, IP Rules, MAC Rules, VLAN Rules, Flood type, Port Statistics, and Port Copy

Using Web Management to managing a **Provider** Unit

To manage a *Provider* unit using web management, connect your PC to any Ethernet port of the *Provider* unit.

Using Web Management to managing a **Subscriber** Unit

By default, a *Subscriber* unit can be managed by the web management through its Ethernet ports. If you wish to manage the *Subscriber* unit remotely (i.e. via a DS3 port), and the unit still has the default IP address, you must first create a static ARP in your PC as described below.

Establishing an Static ARP Table Entry for a *Subscriber* Unit

The *Subscriber* unit's DS3 ports will not respond to an ARP request containing the unit's default IP address. In order to manage the *Subscriber* unit using web management you must create a static ARP table entry on your PC. To build a static ARP table entry:

➤ Procedure

Note – This procedure is not necessary if you are connecting directly to the Ethernet ports on either the *Provider* or *Subscriber* units.

1. Get the MAC address from the bottom label of the *Subscriber* unit.
2. Open a command prompt. (Click on *Start*, and then *Run*. In the open window type **CMD** and press *Enter*.) At the command line, type:

```
arp -s 192.168.254.251 xx-xx-xx-xx-xx-xx
```

where the IP address is the default address of the *Subscriber* unit and the MAC address is the number on the bottom label. For example: if the MAC address on the bottom label is 00-50-ca-01-28-86, type:

```
arp -s 192.168.254.251 00-50-ca-01-28-86
```

Once the ARP table entry is configured, you can ping and manage the unit using web management.

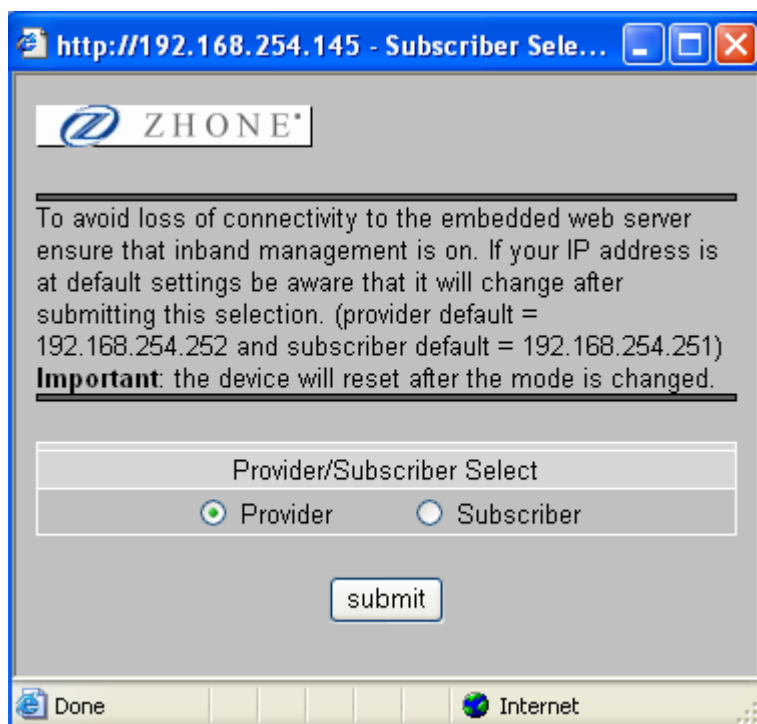
If you change the IP address to anything other than the default, the *Subscriber* unit responds to ARP requests and does not require a static ARP table entry to manage it using web management.

For security purposes you may want to turn off in-band management of the unit to prevent a local PC from managing the unit from the Ethernet ports.

Configuring *Provider* or *Subscriber* Modes

To reconfigure a unit from *Provider* (factory default) to *Subscriber* mode, open the web management home page as described above. Observe the designation displayed on the top-right side of graphical view of the front of the unit (just under the Zhone Logo). It will display either the word “*Provider*” or “*Subscriber*” indicating the current mode of the unit.

To make a change, click on the *Pro/Sub Cfg* button which is located just left of center on the graphical view of the front of the unit. This will bring up the following screen:



Click on one of the radio buttons associated with the desired mode for the unit. Then click on the *submit* button. Go back to the home page and confirm that the display now shows the new operating mode.

Command Line Interface

The network extender can be managed with a Command Line Interface (CLI) through either a direct PC to COM (Communication) Port connection or from a remote network connection via Telnet.

CLI System Requirements

- **Straight-Through 8-Pin Modular Ethernet Cable** – Required for establishing a direct connection from the COM port to a DB9 adapter.
- **DB9 Female to 8-Pin Modular Male Adapter** – Required for conversion of your PC's RS232 serial port for use with the Ethernet cable.
- **Terminal Emulation Program** – Required for running the CLI over a direct connection. The program must emulate a VT100 terminal.
- **Telnet Client** – Required for remote management with the CLI. Microsoft Windows Operating Systems (98, 2000, NT, and XP) include a Telnet client which is run using the Windows command prompt (cmd.exe). If you are using an operating system other than Windows, you may need to install a Telnet client.

Connecting a PC Directly

Initial configuration using the CLI requires a direct physical connection from your PC to the COM port of the network extender you are configuring. After an initial configuration is completed, it is recommended that subsequent configurations be managed through the web interface.

➤ Procedure

1. Plug a DB9 to 8-pin modular adapter into the RS232 serial port on your PC. See *DB9 to 8-Pin Modular Adapter Pin Assignments* on page 22.
2. Connect one end of a straight-through Ethernet cable into the DB9 to 8-pin modular adapter, and the other end of the cable into the COM port on the face of the network extender.

Launching the Terminal Emulation Program

Launch a terminal emulation program on your PC and configure the program settings. The terminal emulation software should be configured as follows (refer to your terminal emulation program's user manual for further information).

Baud:	9600
Data Bits:	8
Flow Control:	none
Parity:	none

Port:	Com 1
Stop Bits:	1
Transmit Delay:	n/a

Logging into the CLI

Once your terminal emulation program has been launched, device information is displayed, followed by a request for username and password. You must log in as a *superuser* in order to make configuration changes.

Username (case sensitive):	superuser
Password (case sensitive):	Password

Using the CLI to Establish In-band Management

Option 1:

After you have logged in, enter a question mark (?) to list the available commands. CLI Set commands are used to establish in-band management. For example:

```
set slot 1 ip_address 137.182.10.251
set slot 1 subnet_mask 255.255.255.0
set slot 1 default_gateway 137.182.10.10
```

The *Subscriber* unit in this example can now be managed with web management by attaching a PC to one of the network extender's Ethernet ports or through the DS3 ports by opening the address 137.182.10.251 in a web browser.

Option 2:

After you have logged in, enter "H" for *Help*, to list the available commands. CLI commands are used to establish in-band management. For example:

```
cd syscfg
cd mgmtcfg
ipaddress 137.182.10.251
subnetmask 255.255.255.0
defaultgateway 137.182.10.10
submit
```

Note – It is necessary to type *submit* and hit *enter* for the settings to be enabled

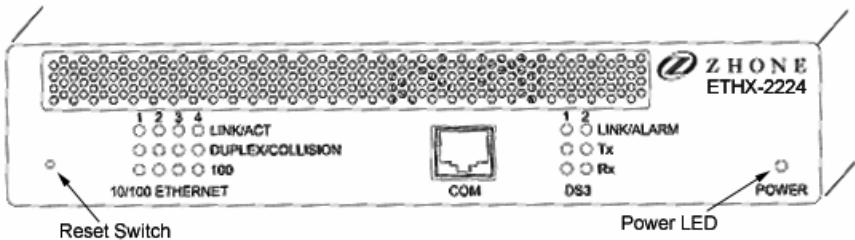
Resetting the Network Extender to Factory Defaults

The network extender supports a reset process that may be used to delete the current configuration and return it to the factory defaults, including the default password.

➤ Procedure

To return the network extender to its factory default configuration:

1. The reset button is located behind a small hole on the left side of the faceplate of the network extender. Use a straightened paper clip to gently push the button and let it go.
2. Wait a few seconds until the DS3 Port LEDs flash green starting at Port 1 and ending at Port 2 (on an ETHX-2224-DS3 unit). Gently push the reset button again within 3 seconds of port 1 or port 2 LED illumination. NVRAM is cleared, and all configurations on the unit are set to the factory defaults.



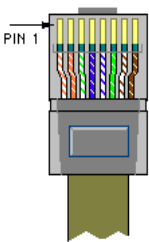
Note – As mentioned previously, the factory default for mode is “*Provider*”. Therefore, if the unit was a “*Subscriber*” unit before the reset, the mode must be changed back to *Subscriber* mode after the reset is complete. The process of changing the mode is described earlier in this manual.

Connector Pin Assignments

Ethernet Pin Assignments

Table 4. Ethernet Pin Assignments

Pin	Function
Pin 1	Rx+
Pin 2	Rx–
Pin 3	Tx+
Pin 4	not used
Pin 5	not used
Pin 6	Tx–
Pin 7	not used
Pin 8	not used



DB9 to 8-Pin Modular Adapter Pin Assignments

To connect the COM port to the DB9 serial port of a PC, use an adapter wired as shown:

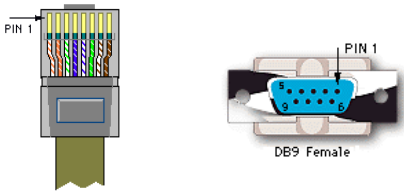


Table 5. DB9 to 8-Pin Modular Adapter Pinouts

Pin	8-Pin Modular Port		Direction	PC RS232 Serial Port		Pin
1	Transmit Data	TxD	→	RxD	Receive Data	2
2	Data Set Ready	DSR	→	RTS	Request to Send	7
4	Receive Data	RxD	→	TxD	Transmit Data	3
5	Ground	GND	→	GND	Ground	5
6	Data Terminal Ready	DTR	→	CTS	Clear to Send	8

Note: Pins not shown are unused.

Specifications

Specifications are subject to change without notice.

Table 6. Specifications

Criteria	Specification
Bandwidth/Distance	Up to 44.736 Mbps per DS3 port ETHX-2214-DS3: Up to 44.736 Mbps ETHX-2224-DS3 Up to 89.472 Mbps using loop bonded DS3 circuits
Dimensions	1.9" x 8.6" x 6.75" (H x W x D) 4.8 cm x 21.7 cm x 17.1 cm (H x W x D)
Interfaces	ETHX-2214-DS3: Two (2) BNC 75 ohm jacks (Tx and Rx) ETHX-2224-DS3: Four (4) BNC 75 ohm jacks (2-Tx and 2-Rx) Four (4) 10/100BaseT RJ45
Operating Environment	Temperature: -40°F to 158°F (-40°C to 70°C) Non-operating temperature: -40°F to 158°F (-40°C to 70°C) Humidity: 5% to 95%, non-condensing Altitude: -200 ft to 16,500 ft (-60 m to 5,000 m)
Power	ETHX-2214-DS3: -48 VDC, 0.2 A, 10 W ETHX-2224-DS3: -48 VDC, 0.3 A, 15 W
Protocols Supported	Transparent 802.1D Bridging DS3 Line Code: unframed and unchannelized DS3 only (M13 and C-Bit DS3 Framing formats are <u>not</u> supported)
Regulatory Compliance	EMC: FCC Part 15 Class A, ICES-003 Safety: ANSI/UL 60950-1, CAN/CSA C22.2 No. 60950-1-03, IEC 60950-1:2001, EN 60950-1:2001
Standards Supported	NEBS Level 1 GR-063-CORE & GR-1089-CORE IEEE 802.3 Ethernet IEEE 802.1p Priorities IEEE 802.1Q VLAN
Weight	1.0 lbs (0.45 kg)

Safety Notices

This product is compliant with the Standards for Safety of Information Technology Equipment (ITE) defined in ANSI/UL 60950-1, First Edition Dated April 1, 2003 with revisions through and including July 7, 2006 and CAN/CSA C22.2 No. 60950-1-03.

EMI Notices

United States – EMI Notice:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense.

The authority to operate this equipment is conditioned by the requirements that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Zhone Technologies, Inc.

If the equipment includes a ferrite choke or chokes, they must be installed per the installation instructions.

Canada – EMI Notice:

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

NEBS Compliance

The equipment has been tested and found to comply with NEBS requirements as defined in Telcordia document SR-3580 Issue 2, January 2005 for NEBS Level 1, plus the amendments to this requirement made by Verizon, AT&T and the Telecommunications Carrier Group in the following documents:

- Telecommunications Carrier Group NEBS Checklist SIT.NEBS.TE.NPI.2004.015, Issued April 4, 2006 (non-Carrier requirements only)
- Verizon NEBS Clarification Document SIT.NEBS.RQS.NPI.2004.019, Issued Feb 27, 2006 (non-Carrier requirements only)

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- Verizon NEBS Requirements by Location SIT.NEBS.RQS.NPI.2005.031, Issued Nov 14, 2005 (non-Carrier requirements only)
 - AT&T TP76200, Issue 10, August 11, 2006 (non-Carrier requirements only)

This testing verifies that the equipment meets the requirements for deployment in a telecommunications carrier's central office for equipment owned by another carrier. It does not imply compliance to NEBS for deployment in any other manner.

Service and Repair

If trouble is experienced with this equipment, please contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Zhone worldwide office locations, use one of the following methods:

- Internet: Visit the Zhone World Wide Web site at www.Zhone.com.
- Telephone: Call our automated system to receive current information by fax or to speak with a company representative.
 - Within the U.S.A. and Canada, call (877) 946-6320 (i.e. 877-ZHONE20)
 - Outside the U.S.A., call +1 (510) 777-7000

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

The customer may make no repairs to the equipment.

Important Safety Instructions



1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
3. Do not attempt to service this product yourself, as opening or removing covers may expose you to hazardous voltage or to other risks. Refer all servicing to qualified service personnel.
4. General purpose cables are used with this product for connection to the network. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
5. When installed, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
6. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are interconnected, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
7. Input power to this product must be provided by one of the following: (1) a UL Listed/CSA certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified Class II power source, with a Safety Extra Low Voltage (SELV) output having a maximum of 240 VA available, for use in the country of installation.
8. In addition, since the equipment is to be used with telecommunications circuits, take the following precautions:
 - Never install telephone wiring during a lightning storm.
 - Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
 - Never touch un-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
 - Use caution when installing or modifying telephone lines.
 - Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
 - Do not use the telephone to report a gas leak in the vicinity of the leak.

**** ETH3-A2-ZN10-10 ****
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